

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A device-implemented routing system comprising:

a plurality of device-implemented routing resources, including:

device-implemented logic resources including routing processes to determine routing for received packets and forwarding processes to forward the received packets to an appropriate destination; and

device-implemented physical resources comprising control resources and data resources, the control resources including at least one routing table and the data resources including physical specifications of the routing system; and

a plurality of device-implemented virtual routers to reconfigurably share the device-implemented routing resources, among the device-implemented virtual routers, in accordance with a plurality of programmably modifiable resource sharing configurations to be reconfigurably modified by a user, in order to implement different device-implemented virtual router configurations based on different sets of network requirements, where the programmably modifiable resource sharing configurations specify which of the routing processes, the forwarding processes, the control resources, and the data resources are to be shared between the plurality of device-implemented virtual routers and specify which of the routing processes, the forwarding processes, the control resources, and the data resources are not to be shared between the plurality of device-implemented virtual routers.

2-7. (canceled)

8. (Currently amended) A network point-of-presence (POP) comprising:
a single physical router having a plurality of resources, including
logic resources, including routing processes to determine routing for
received packets and forwarding processes to forward the received packets to an
appropriate destination; and
physical resources comprising control resources and data resources,
the control resources including at least one routing table and the data resources
including physical specifications of the single physical router;
at least one backbone router, having a routing capacity, implemented, at an
end-point of a high capacity network link, as a virtual router by the single physical
router; and
at least one regional router, ~~having a routing capacity that is below the
routing capacity of the at least one backbone router,~~ implemented as a virtual
router by the single physical router, where
the backbone virtual router and the regional virtual router reconfigurably
share resources_z of the single physical router_x based on a plurality of resource
sharing configurations and an input by a user, in order to implement different
device-implemented virtual router resource sharing configurations based on
different sets of network requirements, where the resource sharing configurations,
in conjunction with the input by a user, specify which of the routing processes, the
forwarding processes, the control resources, and the data resources are to be

shared between the backbone virtual router and the regional virtual router routers and specify which of the routing processes, the forwarding processes, the control resources, and the data resources are to be separately implemented by the backbone virtual router and by the regional virtual router.

9. (original) The network POP of claim 8, further comprising:
ports connecting the backbone virtual router to a high capacity transit network; and

ports connecting the regional router to a metropolitan area network.

10-15. (canceled)

16. (Currently amended) A method, performed by a single device in a network, comprising:

allocating a first set of resources as shared resources;

allocating a second set of resources as non-shared resources, where the allocating the first set of resources and the allocating the second set of resources include:

allocating logic resources, including routing processes to determine routing for received packets and forwarding processes to forward the received packets to an appropriate destination; and

allocating physical resources comprising control resources and data resources, the control resources including at least one routing table and the data resources including physical specifications of the single device; and

implementing a plurality of virtual routers based on a reconfigurable sharing of resources, from the first set of resources, between the virtual routers and based on reconfigurably and independently assigning resources of the second set of resources between each of the virtual routers, where the resources included in the first set of resources and the resources included in the second set of resources may be reconfigurably modified by a user, in order to implement different device-implemented virtual router configurations based on different sets of network requirements, where the device-implemented virtual router configurations identify which of the routing processes, the forwarding processes, the control resources, and the data resources are to be shared between the plurality of virtual routers and identify which of the routing processes, the forwarding processes, the control resources, and the data resources are to be separately implemented by the virtual routers.

17-22. (canceled)

23. (Currently amended) A device-implemented router comprising:

- a device-implemented means for performing routing processes to determine routing for received packets;
- a device-implemented means for performing forwarding processes to forward the received packets to an appropriate destination;
- a device-implemented means for implementing control resources;
- a device-implemented means for implementing data resources, including physical specifications of the device-implemented router; and

a device-implemented means for implementing a plurality of virtual routers that share ones of the device-implemented means for performing routing processes, the device-implemented means for performing forwarding processes, the device-implemented means for implementing control resources, and the device-implemented means for implementing data resources, based on a plurality of programmably modifiable resource sharing configurations that are programmably modifiable by a user to share resources between the plurality of virtual routers, in order to implement different device-implemented virtual router configurations based on different sets of network requirements, where the programmably modifiable resource sharing configurations specify which of the device-implemented means for performing routing processes, the device-implemented means for performing forwarding processes, the device-implemented means for implementing control resources, and the device-implemented means for implementing data resources are to be shared between the plurality of virtual routers and specify which of the device-implemented means for performing routing processes, the device-implemented means for performing forwarding processes, the device-implemented means for implementing control resources, and the device-implemented means for implementing data resources are not to be shared between the plurality of virtual routers.

24. (previously presented) The routing system of claim 23, where the means for performing routing processes includes means for building routing tables and forwarding tables based on network topology.

25. (previously presented) The routing system of claim 24, where the means for performing forwarding processes includes means for comparing information in packet headers to the forwarding tables.

26. (previously presented) The routing system of claim 24, where the means for implementing control resources includes means for storing the routing and forwarding processes.

27. (canceled)

28. (previously presented) A method, performed by a single router in a network, comprising:

allocating a set of routing resources as shared resources, where the allocating the set of resources includes:

allocating logic resources, including routing processes to determine routing for received packets and forwarding processes to forward the received packets to an appropriate destination; and

allocating physical resources comprising control resources and data resources, the control resources including at least one routing table and the data resources including physical specifications of the single router;

selecting, by a user, a first desired resource sharing configuration, based on a first set of network requirements, to be implemented by a plurality of virtual routers, from a plurality of routing resource sharing configurations, the plurality of routing resource sharing configurations including:

a first configuration, where the plurality of virtual routers do not share resources;

a second configuration, where the plurality of virtual routers only share control resources;

a third configuration, where the plurality of virtual routers only share data resources;

a fourth configuration, where the plurality of virtual routers only share data resources and forwarding processes;

a fifth configuration, where the plurality of virtual routers only share data resources and routing processes;

a sixth configuration, where the plurality of virtual routers only share data resources, forwarding processes and routing processes;

a seventh configuration, where the plurality of virtual routers only share data resources and control resources;

an eight configuration, where the plurality of virtual routers only share data resources, forwarding processes and control resources;

a ninth configuration, where the plurality of virtual routers only share data resources, routing processes and control resources; and

a tenth configuration, where the plurality of virtual routers share data resources, routing processes, forwarding processes and control resources;

implementing the plurality of virtual routers based on the first desired resource sharing configuration;

implementing a second desired resource sharing configuration, different than the first desired resource sharing configuration, based on a second set of network

requirements, different than the first set of network requirements.